

REMARKS

Upon entry of this amendment, independent claim 1 with dependent claims 3-8, and independent claim 9 will be present in the application.

Claim 1 has been amended to recite that the recirculation device comprises only a single siphon-trap gas seal and a single device for fluidizing the separated solids. Claim 1 has also been amended to recite that the single siphon-trap gas seal includes only a single riser. Such apparatus is shown and discussed in the figures and specification of the subject application. Claim 2 has been rewritten in independent form as claim 9. Therefore, the amendments do not introduce new matter into the application.

Claims 1-8 were rejected under 35 U.S.C. § 103(a) as being obvious over U.S. 5,463,968 (Abdulally), the Office Action contending that Abdulally discloses

at least one recirculation device for recirculating at least a portion of the separated solid particles from the cyclone separator into the reactor chamber (fig. 1), the at least one recirculation device comprising a siphon-trap gas seal including a riser having a ... (66, fig. 1), an upper end (fig. 1), and first and second outlet openings on the ... of the riser proximate of the upper end (42a, 42b, fig. 3), the first and second outlet openings pointing substantially in the direction of the reactor chamber (fig. 2), a device for fluidizing the portion of the separated solid particles, and a device for connecting each opening of the gas seal riser with the reactor chamber (73a, 73b, fig. 2)

The Office Action admits that Abdulally does not disclose "circumference, symmetrical, an angle of 60 to 180 degrees, 90 degrees to each other, [or] symmetrically. However, the Office Action alleges that

it would have been an obvious matter of design choice to a person of ordinary skill in the art to have symmetrical, circumference, an angle of 60 to 180 degrees, 90 degrees to each other, symmetrically because the applicant has not disclosed that the shape, or location provides an advantage, is used for a particular purpose or solves a stated problem. One of ordinary skill in the art, furthermore, would have expected Applicant's invention to perform equally well with either the shape or location, or symmetrically of Abdulally or the claimed shape or location because both shapes and locations perform the same function of recirculating equally well.

The claimed invention is a recirculation device comprising a single gas seal 7, 8, 9 with a single device for fluidizing the separated portion of solids and a single riser 9 and the one riser has two outlet openings 11 at its upper end at the circumference. That

means that the separated solids are lifted by a fluidizing medium within the one riser 9 and uniformly distributed to the two outlet openings at the upper end of the riser. It cannot logically be argued that Abdullalys teaches or suggests a recirculation device that is remotely similar to the subject invention. In the Abdullalys patent, the siphon has a riser 58b with a single opening 42a at the top (see fig. 3). The splitting of the solids into different streams is not performed at the top of the riser 58b, but at the bottom via openings 56d and 56e. Openings 42a and 42b are **not** connected to the same riser. Openings 42a and 42b are **not** at substantially the same height (see fig. 3).

In the subject invention, the solids or ash is split at the top of a single riser into two solid streams (see page 8). The openings are arranged at the same height (see page 8). This is a significant difference and provides several advantages. Principally, splitting the solids at the top of the riser requires less fluidizing air than conventional systems and provides higher operational safety (no risk that solids leave the siphon only via 1 opening and not as desired via 2 openings).

Further the purpose of the Abdullalys apparatus is to control (vary) the split of solid between two heat exchangers 60, 64 and bypass duct 58b, (see for example col. 9, claim 1, line 5 to 6 or col. 7, lines 59 to 61). The purpose of the subject invention is to split and distribute the solids into two equal solid streams (see page 2, lines 21-22). A control is not required because the openings are located at the top of the riser at the same height. Thus it is ensured that the solid distribution to the two openings is similar.

As taught by Abdullaly ("normal operation" as described in col. 6, line 67 continuing and "initial start up" as described in col. 7, line 19 continuing), two parallel siphons are required which are each equipped with a heat exchanger. The first siphon consists of the arrangement in compartment 58b and the second siphon consists of compartment 58c. It is clear that this arrangement of two siphons has several disadvantages, compared to the single siphon of the present invention: 1) higher installation cost; 2) more space is required; and 3) more fluidizing air is required. In the present invention, only one siphon is used which splits the solid flow into two solid streams. This solid splitting device requires little space.

In the Abdullaly patent, a special control of the fluidizing air is required using four different fluidizing air compartments 52a, 52b, 52c, 78. The air to these compartments

must be controlled separately (see col. 7, lines 19-22). Consequently, the amount of fluidizing air that is required by Abdullaly is very large. The present invention requires only two fluidizing air compartments, one for the downcomer part and one for the riser part. Therefore, the amount of fluidizing air required by the subject invention is much smaller.

As mentioned above, when the Abdullaly apparatus works in "normal operation", only compartment 58c is fluidized by air via section 52c of plenum 52 and nozzles 68. Therefore, the discharge of solids during "normal operation" can only occur through one outlet opening 42b (see col. 6, line 67 continuing). During "initial start up" (see col. 7, line 19 to 31), the sliding gate valve 59b is closed and the fluidizing air to the plenum section 52b is turned on while the air flow to section 52c is turned off. The solids in compartment 58c thus slump and therefore seal this compartment from further flow. The solids from dipleg 34 pass into compartment 58b and the air passing into the latter compartment from the plenum section 52b force the material upward and outward through opening 42a), and conduit 73a to enclosure 10. This discharge of the solids functions is a direct bypass. That means, that during "initial start up" only one opening 42a is in operation. This is also the case if the sliding gate valve 59a is opened for "low load operation" (see col. 7, line 32 to 48). In no operating condition are both openings 42a and 42b used for discharging solids, which are at the same time conveyed by fluidizing air.

MPEP § 706.02(j) states "[t]o establish a *prima facie* case of obviousness, three basic criteria must be met. ... the prior art reference (or references when combined) must teach or suggest all the claim limitations." See also MPEP §§ 2142 and 2143. As shown above, there are a number of elements recited in both claim 1 and claim 9 that are taught or suggested by the prior art. Accordingly, the rejection must be withdrawn.

The various dependent claims add additional features to the independent claims, and are therefore believed to be allowable. Also, the dependent claims are believed patentably distinct on their own merits as being directed to combinations not suggested by the references.

In view of the above-directed amendments and the proceeding remarks, prompt and favorable reconsideration is respectfully requested.

Respectfully submitted,

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